

## AIR PATHWAY ASSESSMENT

This enclosure provides general information related to air pathway assessments. An air pathway assessment is not a separate task but is an integral part of investigations and studies. Team members that should be involved in scoping aspects of air pathway assessments include the chemist, industrial hygienist, air modeler, risk assessor, process engineer, and possibly a meteorologist. Sources of additional guidance and information are listed at the end of this enclosure.

### Definition of Air Pathway Assessment (APA):

An air pathway assessment (APA) is a systematic evaluation of the potential or actual effects on air quality of an emission source such as a hazardous waste site. The APA may involve modeling or monitoring to estimate these effects. The primary components of an APA are:

- characterization of air emission sources;
- determination of the effects of atmospheric processes such as transport and dilution; and
- evaluation of the exposure potential at receptors of interest.

### Why APA's are necessary:

During site characterization activities, all contaminant migration pathways, including groundwater, surface water, direct contact, and air, are to be evaluated. Often, air pathways are overlooked because baseline emissions at undisturbed sites may be almost imperceptible and air pathways do not appear significant. Even low-level emissions may be of concern if toxic or carcinogenic compounds are present. Due to the type of activities, emissions during site remediation are often much higher than baseline emissions. Failure to perform an adequate air pathway assessment may result in an underestimate of the risk from the site and possibly work stoppages, cost increases and public relation problems during remediation.

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#### Goals of APA:

The overall goal of an air pathway assessment is to evaluate the site's actual or potential effects on air quality. Specific goals are to evaluate the exposure of on-site workers, the exposure of the off-site populace, or to evaluate environmental impacts.

#### APA Activities:

Activities associated with air pathway assessments may be necessary during all phases of investigations, studies, designs, and remedial actions. Typical activities at hazardous waste sites can be divided into the following four categories:

- 1) Qualitative (screening) evaluation of site emissions and impacts on air quality under baseline or undisturbed conditions;
- 2) Quantitative evaluation of site emissions and their effect on air quality under baseline or undisturbed conditions;
- 3) Quantitative evaluation of emissions and their effect on air quality from pilot-scale remediation activities;
- 4) Quantitative evaluation of the effects on air quality of full-scale remediation activities.

Although this scope guidance does not address design activities directly, the intent is to provide adequate information to select the best remedial alternative and perform the subsequent design. Evaluation of potential impacts of full-scale remediation activities on air quality may have significant implications when evaluating costs and implementability of alternatives.

As an aid to team members, air pathway assessment activities typically performed during various stages of investigations and studies are briefly described below:

#### APA activities during CERCLA Site Inspections (SI) and RCRA Facility Assessments (RFA):

Goal: Demonstrate what emissions, if any, are coming from the site and what areas may be affected by these emissions.

Monitoring: Surveys of site emissions to 1) determine worker exposure, 2) determine general levels of pollutants present in ambient air, and 3) identify any emission "hot spots."

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Modeling (if any): Screening study to determine areas of maximum impact from site emissions. Results are used to aid in design of an ambient air monitoring network for subsequent phases and to determine whether an emergency response action is warranted.

APA activities during CERCLA Remedial Investigations (RI) and RCRA Facility Investigations (RFI):

Goal: Obtain a more detailed knowledge of the potential air contaminants that are present and determine the risk potential of the site (to on-site workers and off-site receptors).

Monitoring: Similar to monitoring described under SI/RFA but speciation of compounds and location of emission sources are studied in greater detail. Involves fenceline ambient air monitoring at undisturbed sites to determine background concentrations of airborne contaminants and ambient air monitoring just downwind of the emission source to develop emission rate or flux estimates, also monitoring to determine the exposure of on-site workers.

Modeling: Performed as part of the fate and transport analysis and for use in the baseline risk assessment or as an aid in siting an ambient air monitoring network.

APA activities during CERCLA Feasibility Studies (FS) and RCRA Corrective Measures Studies (CMS):

Goal: As the possible remediation alternatives are developed and evaluated, determine emission rates that will probably be encountered during the remedial action.

Monitoring: Performed to investigate emission rates from various remedial activities and alternatives. If pilot scale tests are performed, emission rates may be measured to assist in evaluating impacts from full scale operations.

Modeling: Performed as part of the detailed analysis of alternatives to evaluate the air impacts from full-scale remedial activities or as an aid in siting an ambient air monitoring network.

Sources of Information

Much of the information presented in this enclosure has been summarized from an EPA guidance document, "Air/Superfund National Technical Guidance Study Series, Volume I - Overview of Air Pathway Assessments for Superfund Sites (Revised)", EPA-450/1-89-001a. This is one in a series of manuals dealing with air pathway assessments for hazardous waste sites. Team members involved in air pathway assessments are urged to utilize this guidance document. It contains an

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excellent summary of sources of information and guidance for  
APA work. Some of the topics included are:

- Ambient air monitoring
- Meteorological monitoring
- Emission Rate measurements
- Emission Rate estimates
- Atmospheric dispersion modeling

For in depth information about these topics team members are  
urged to consult available sources of current information  
outlined in Volume I.